

1966 OPERATING SUMMARY

HUNTSVILLE

water pollution control plant

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W38
1966
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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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OFFICE OF THE GENERAL MANAGER

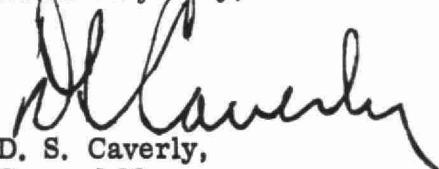
Members of the Huntsville Local Advisory Committee,
Town of Huntsville.

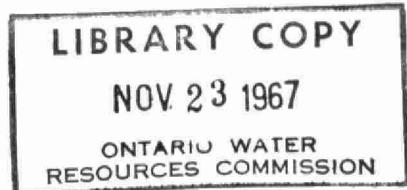
Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the
Huntsville Water Pollution Control Plant, OWRC Project No. 58-S-15.

It is hoped that our joint participation in efforts to combat water pollution
will have even more success in the coming year.

Yours very truly,


D. S. Caverly,
General Manager.





ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Huntsville Water Pollution Control Plant, OWRC Project No. 58-S-15.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in cursive ink, appearing to read "B.C. Palmer".

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

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FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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HUNTSVILLE

water pollution control plant

operated for

THE TOWN OF HUNTSVILLE

by the

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'66 REVIEW

In 1966, the Huntsville Water Pollution Control Plant treated a total of 97,467,000 gallons of waste, for an average daily flow of 267,000 gallons, exceeding the design flow by 17,000 gallons per day. This is the largest volume of waste handled in the plant's six years of operation. The increase in flow, it is felt, is due to the increased amount of surface water gaining access to the sewer system.

The operating costs of the treatment plant and associated pumping stations in 1966 were \$10,925.38, or \$112.09 per million gallons of sewage treated. The operating costs increased approximately \$1,000 in 1966 from the \$9,949.50 operating costs of the previous year.

The operating costs increased primarily because of increases in salary, higher power costs due to increased flows, and increased costs for repairs and maintenance.

In February, the forcemain from the No. 2 pumping station ruptured near the south wall of the pumping station. This required excavation and repair of the broken pipe during sub-zero weather. Because the pipe had sheared off at the wall of the pumping station, a hole had to be broken through the wall so that a coupling could be used to connect the new pipe to the old section of the forcemain. Excellent co-operation was received from the Town works crew and the Public Utilities Commission personnel.

The dry well of the No. 1 pumping station became flooded when the packing on one of the pumps let go and the sump pump was unable to carry the load.

The digester circulating pump, the raw sewage pump in the No. 2 pumping station and the raw sewage pump in the No. 3 pumping station were torn down and completely overhauled and rebuilt where necessary. Because of the location of these pumps, dismantling was a major problem.

The electric motor for the water seal pump at the No. 3 pumping station was removed and rewound because the motor had burned out.

The gear reducer at the final clarifier was dismantled and the necessary parts such as gears, bearings, seals and gaskets replaced.

Considerable time and effort was also extended in the maintenance of the pump in the Mountview manhole. The installation here does not facilitate good maintenance. This motor also burned out and had to be sent to Orillia to be rewound and then placed back into service.

An effluent pump was purchased for the plant to utilize plant effluent for a water supply for the chlorinator, for the hosing down of tanks and for watering of the lawn around the plant area. This work included the cementing of the pump on a proper base, making the necessary electrical connections to the pump, and connecting the pump discharge to the existing piping. The pump proved very successful, and a considerable saving in operating costs was made due to the fact that this water did not have to be purchased from the Public Utilities Commission.

The operator also spent considerable time with the Town works crews in locating and tracing out various sewer connections throughout the Town. An effort was made to locate illegal connections to storm sewers.

In August, the Town was advised that the work load at the plant had increased to more than one man could handle. At the present time discussions are being pursued with the Town as to a favourable arrangement that can be employed to alleviate the understaffing problem at the plant and to protect the capital investment of the project more adequately. Since the project has been operated for some time with only one operator, difficulty has been experienced at times in finding replacements for holiday and weekend coverage.

In 1966, a total of eleven 8-hour composite samples were collected from the treatment plant and the samples analyzed for 5-day BOD and SS. The average BOD of the influent was 148 ppm and the average SS in the influent was 114 ppm. The plant effluent had an average 5-day BOD of 5 ppm and an average SS of 12 ppm. These results are well within the objectives of the Ontario Water Resources Commission. The average BOD removal for the year was 94 percent and the average SS removal for the year was 89.5 percent.

PROJECT COSTS

NET CAPITAL COST (Final)
Long Term Debt to OWRC \$452,388.75

Net Operating	\$ 10,925.38
Debt Retirement	-
Reserve	4,000.00
Interest Charged	25,452.42
TOTAL	<u>\$ 40,377.80</u>

RESERVE ACCOUNT

Balance at January 1, 1966	\$ 16,700.43
Deposited by Municipality	4,000.00
Interest Earned	1,027.10
Less Expenditures	-
Balance at December 31, 1966	<u>\$ 21,727.53</u>

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDY	WATER
JAN	503.65	386.36	10.68						106.61		
FEB	619.13	332.25	14.24	45.30	130.56		15.02			80.30	21.46
MARCH	898.75	366.40	99.68	50.70	140.28		43.02	6.35	6.55	185.77	
APRIL	1550.69	691.53	35.60	47.10	134.35		18.70	65.63	129.01	416.32	12.45
MAY	943.11	385.83	67.64	79.50	140.63	141.75	32.97	53.24	18.92	22.63	
JUNE	1151.14	479.86	45.28	54.30	258.55		93.78	0.36	23.99	131.35	62.67
JULY	647.79	367.84	38.05	29.70			55.22		39.62	117.36	
AUG	1033.47	387.14	7.12	15.40	136.07	141.75	33.65		170.39	95.62	46.33
SEPT	905.21	547.22		22.77	141.31		15.50		93.14	85.27	
OCT	955.32	438.61	71.05	7.30	128.06		45.23		2.43	223.25	39.39
NOV	832.78	393.57	142.10	27.30	133.34		44.01			92.46	
DEC	884.34	367.84		92.80	271.44		26.50		114.94	(1.68)	12.50
TOTAL	10925.38	5144.45	532.44	472.17	1014.59	283.50	423.60	125.58	705.60	1428.65	194.80

* SUNDY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$632.40

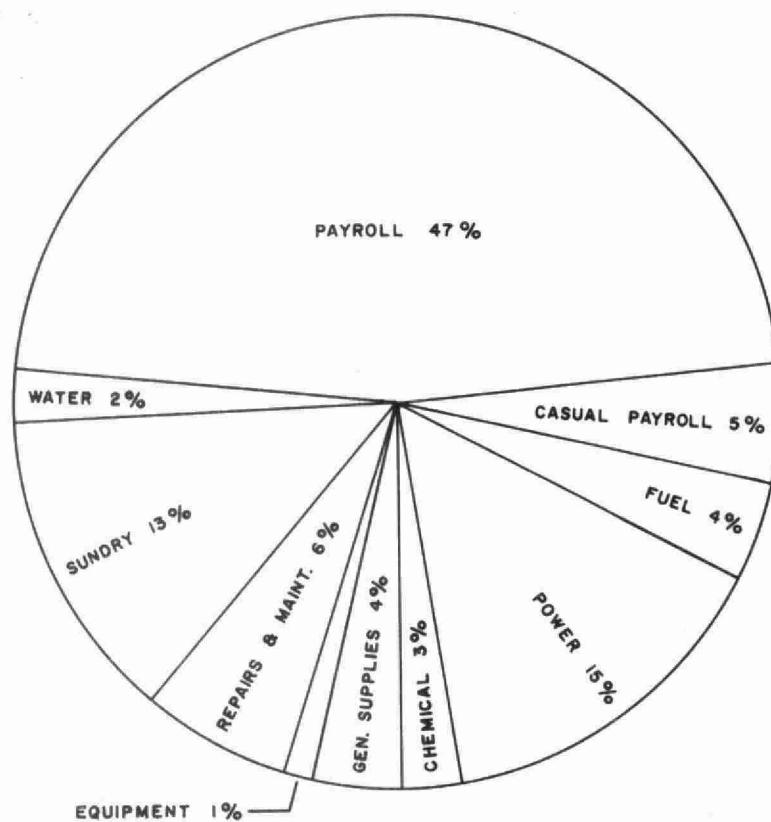
BRACKETS INDICATE CREDIT

YEARLY OPERATING COSTS

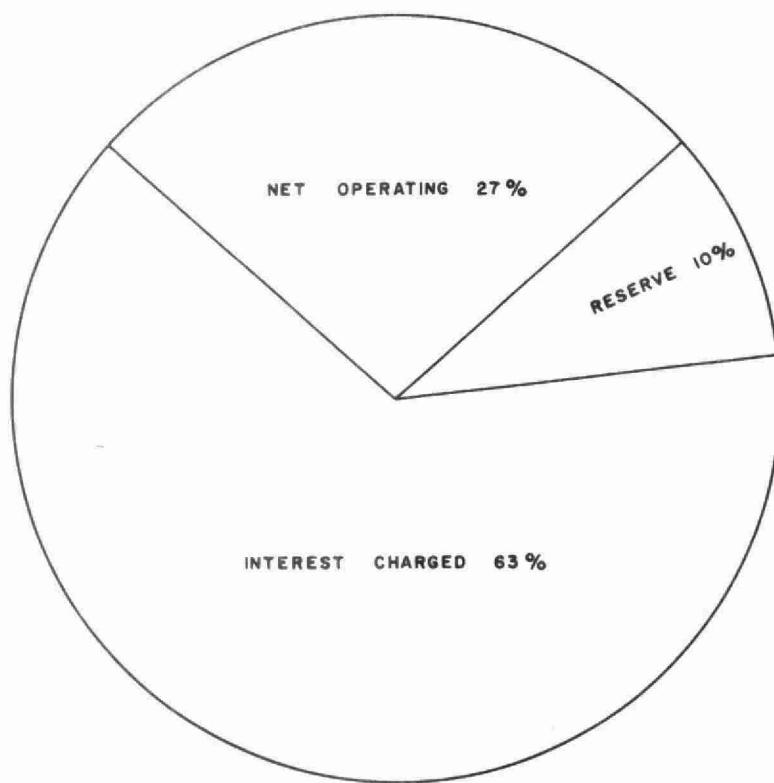
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1961	36,273	\$ 8914.49	* \$ 11.58	\$ 246.00	19 CENTS
1962	59,580	\$ 2458.91	\$ 11.00	\$ 142.00	8 CENTS
1963	65,140	\$ 9645.51	\$ 12.56	\$ 148.00	15 CENTS
1964	63,247	\$ 10121.07	\$ 12.83	\$ 159.75	12 CENTS
1965	66,647	\$ 9949.50	\$ 12.64	\$ 149.29	11 CENTS
1966	97,467	\$ 10925.38	\$ 13.92	\$ 112.09	8 CENTS

* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

1966 OPERATING COSTS



TOTAL ANNUAL COST



Process Data

Flows

From the plot of probability of flows it should be noted that the design flow of 250,000 gallons per day was exceeded 50 percent of the time. In other words, the design flow was exceeded at the plant approximately every other day. It should be noted also that the 1966 curve has shifted up considerably from those of the years 1963, 1964 and 1965. It is felt that this is due to increased surface water gaining access to the sanitary sewers.

On the average daily flow graph, the flows received at the plant in 1966 are also significantly greater than those from previous years.

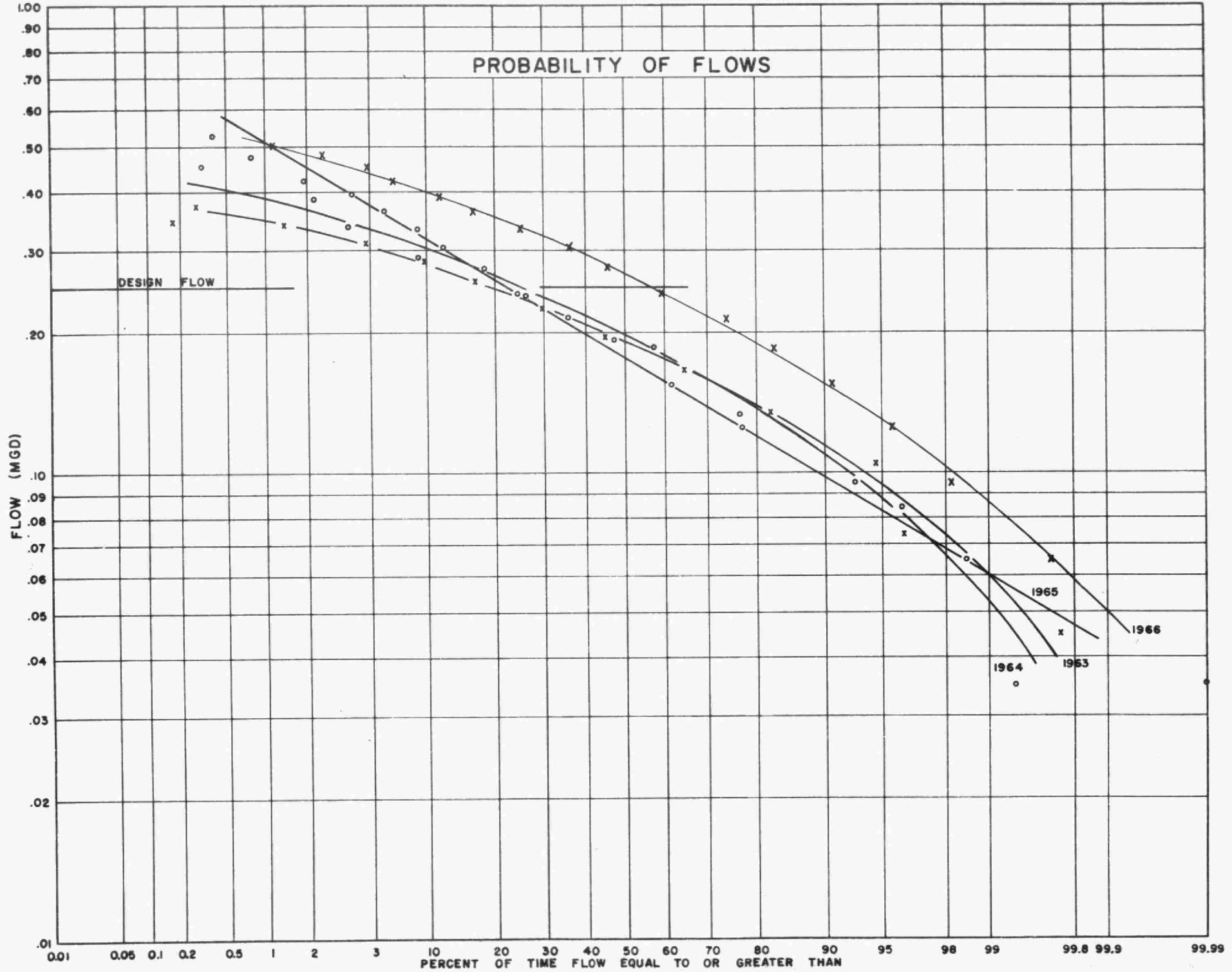
Probability of BOD

From the plot of probability of BOD it will be noted that the 1966 raw sewage BOD has not changed significantly from that of 1965. The raw sewage BOD, however, did exceed 200 ppm 20 percent of the time or approximately 150 ppm 50 percent of the time. The BOD in the final effluent exceeded 9 ppm approximately 50 percent of the time. This is well below the objectives of the OWRC for a final effluent from a treatment plant.

Probability of Suspended Solids

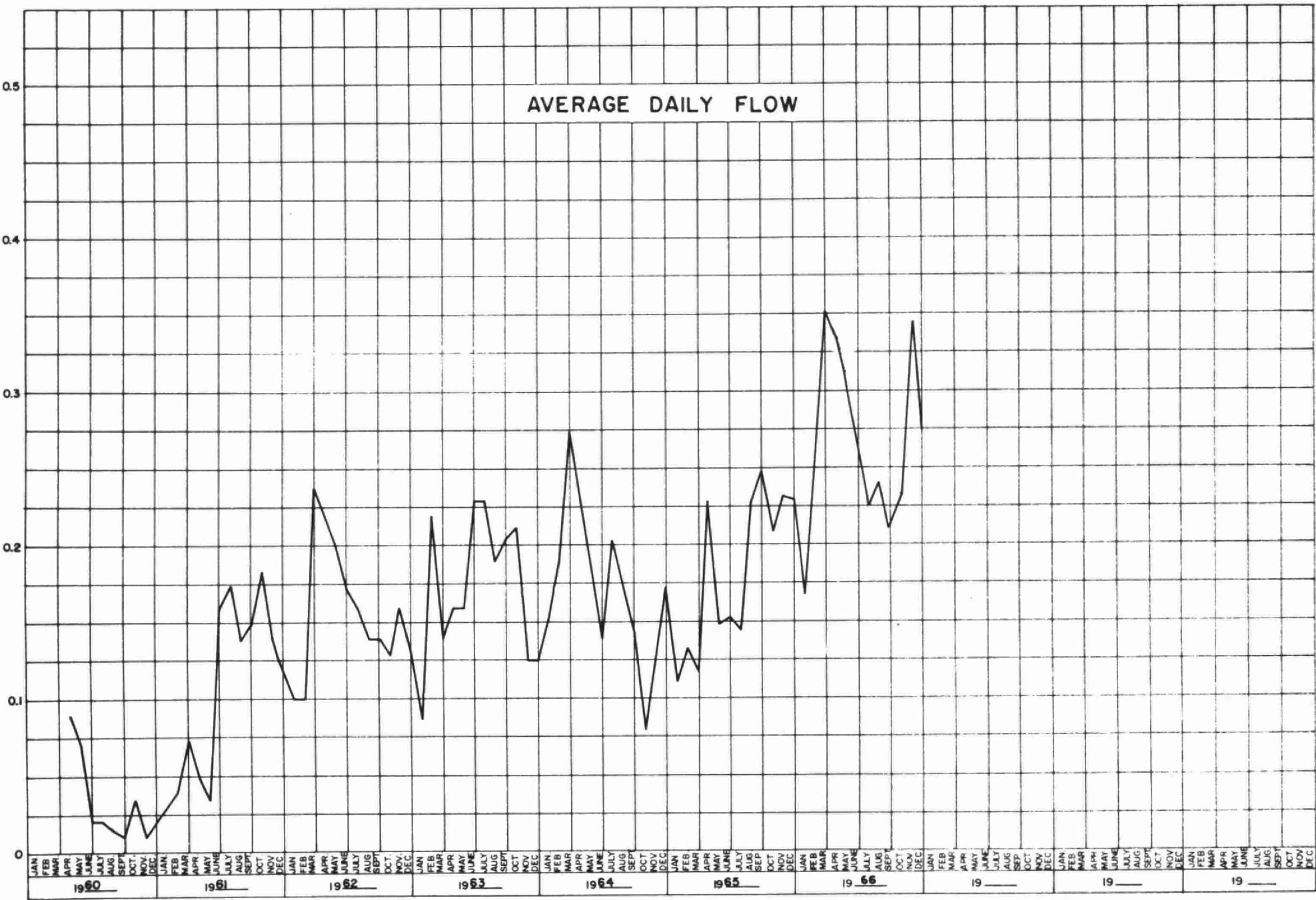
From the plot of suspended solids it will be noted that the SS in the raw sewage decreased somewhat in 1966. The SS in the raw sewage exceeded approximately 125 ppm 50 percent of the time. The concentration of SS in the final effluent was 12 ppm 50 percent of the time.

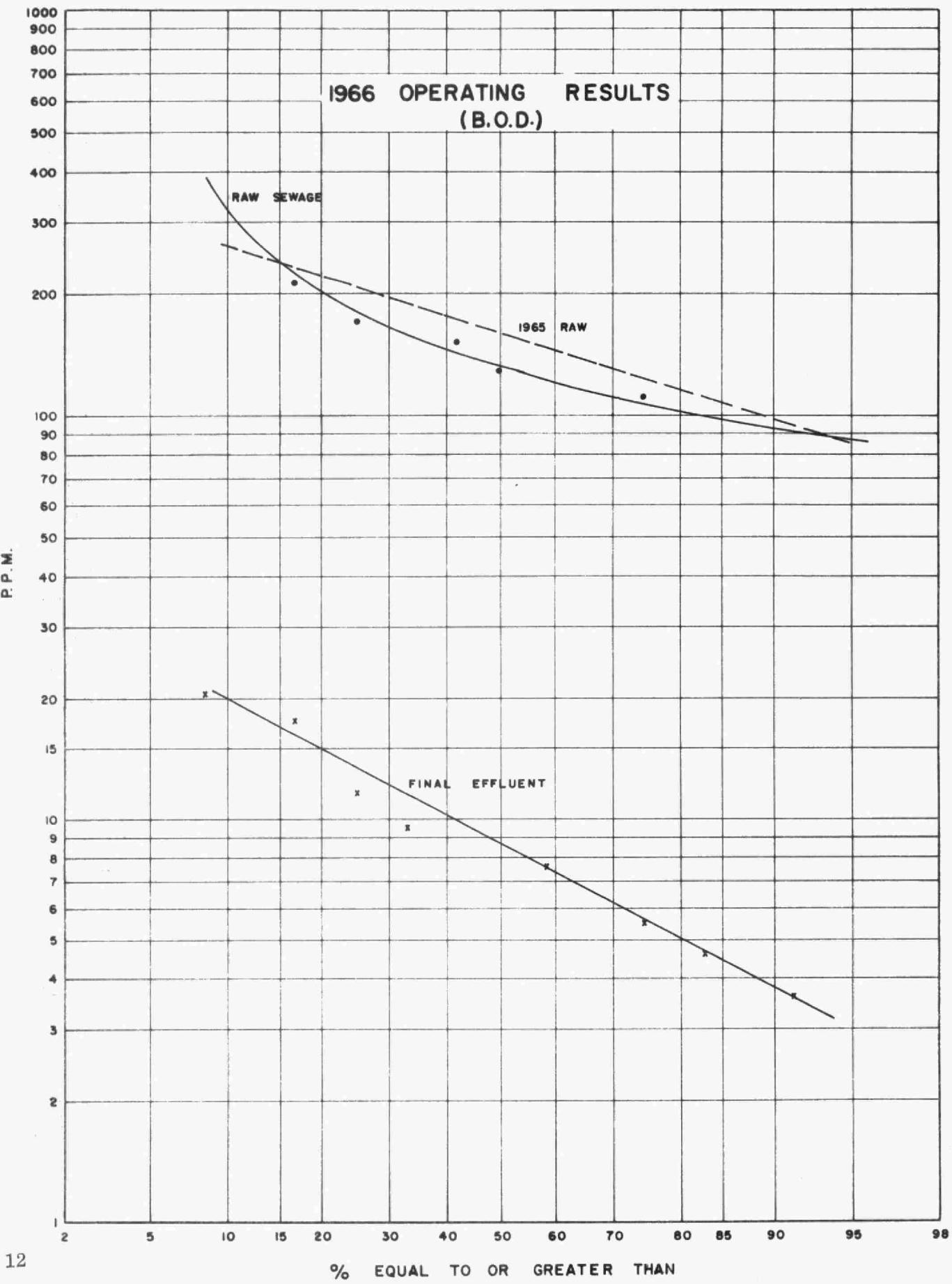
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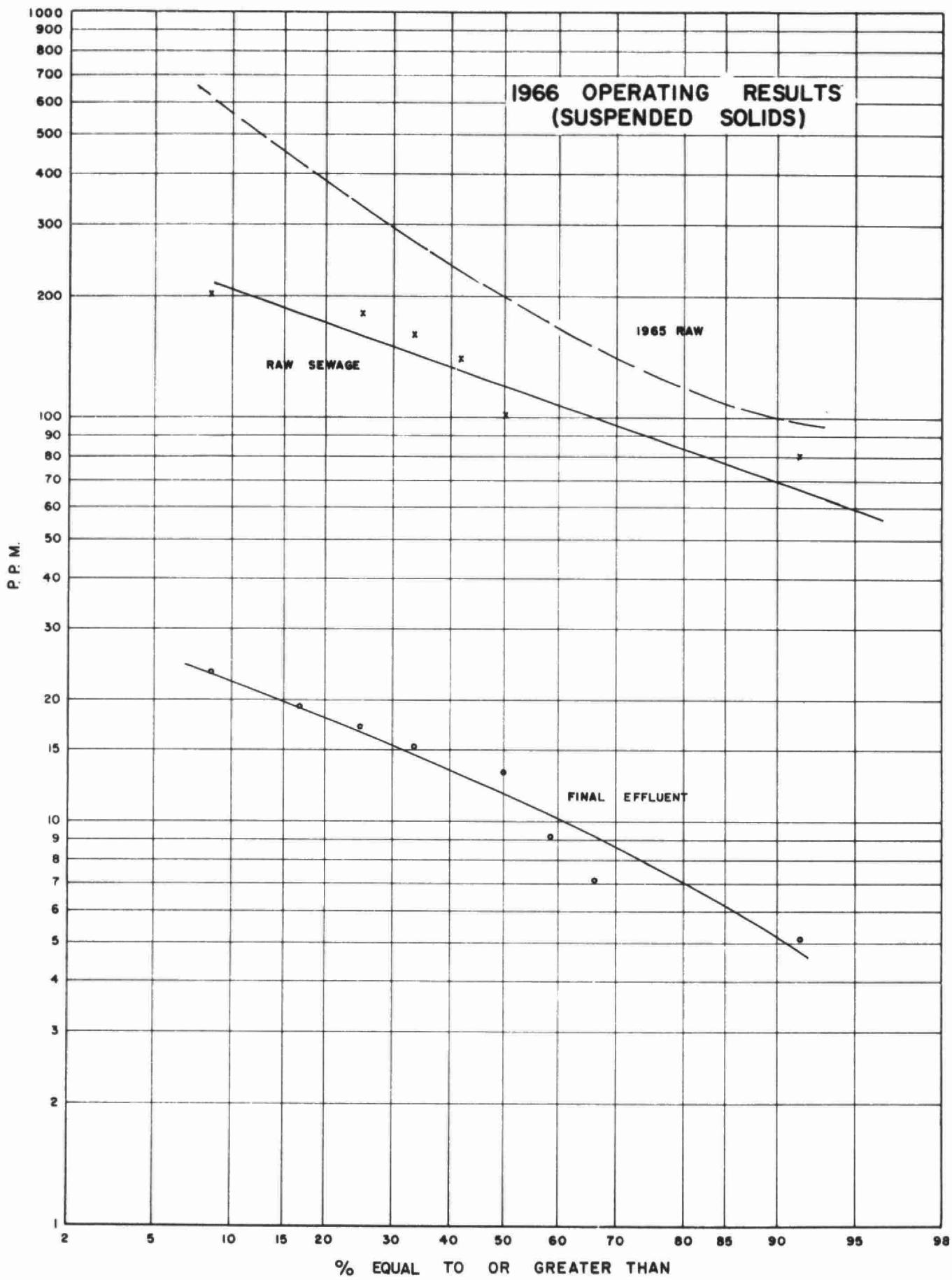


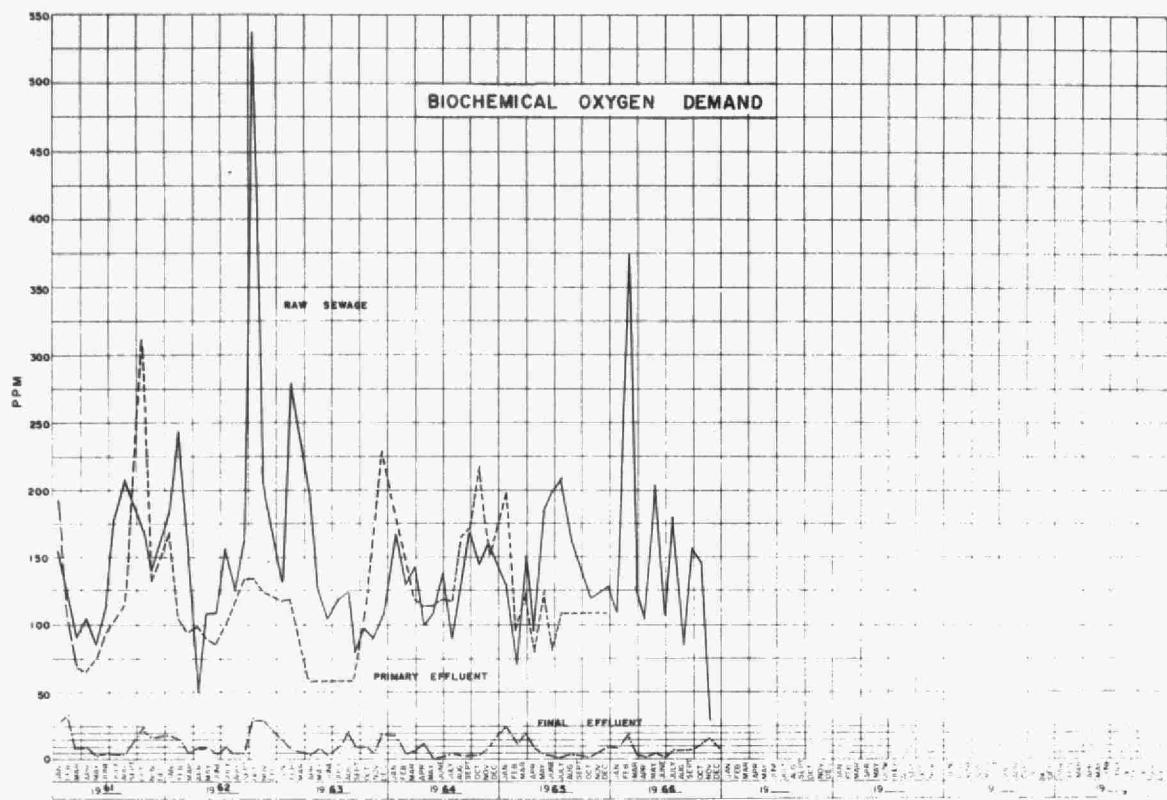
AVERAGE DAILY FLOW

M.G.D.

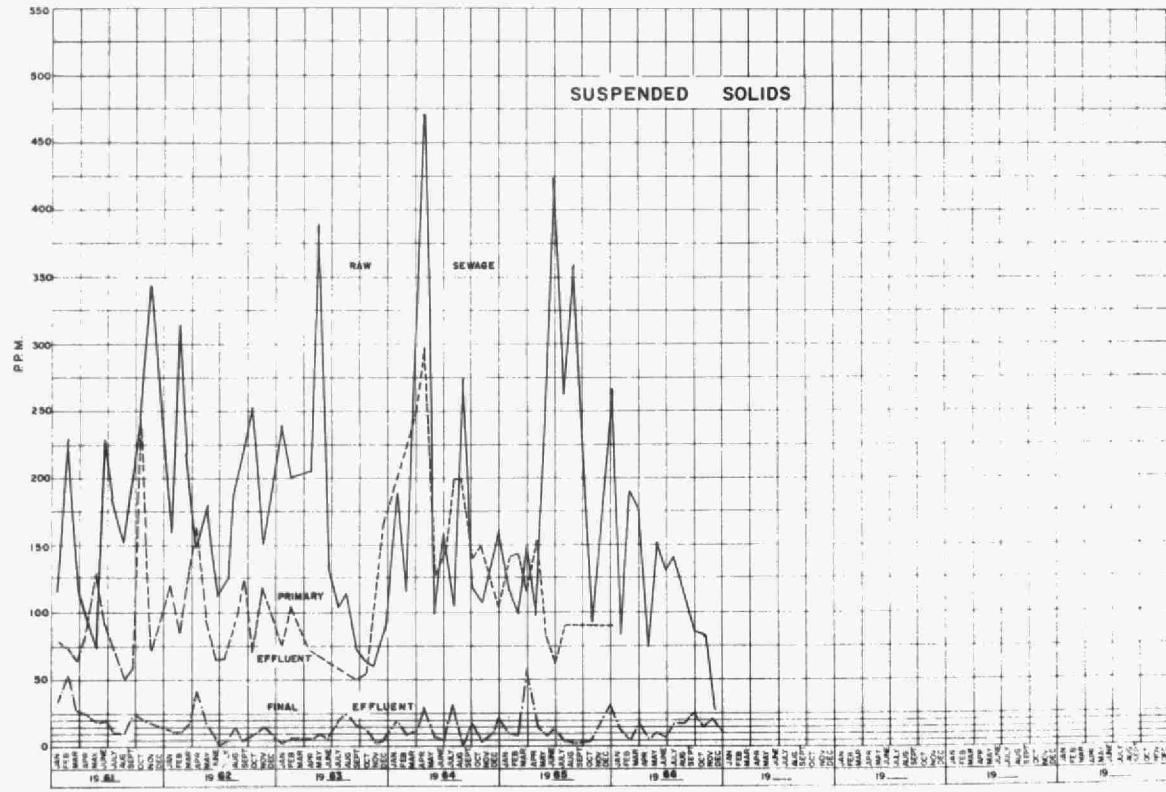








MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	110	10	91.0	2.6	82	14	83.0	1.6	1
FEB.	380	20	94.5	13.4	192	4	98.0	7.0	24
MAR.	128	5	96.0	6.7	176	16	92.0	8.7	14
APR.	104	4	96.0	5.0	71	5	93.0	3.3	33
MAY	205	5	97.5	9.6	158	10	93.5	7.1	14
JUNE	105	3	97.0	4.0	130	7	94.5	4.8	13
JULY	180	8	96.0	6.0	140	6	95.5	4.6	15
AUG.	84	8	90.5	2.8	108	17	84.0	3.4	26
SEPT.	160	8	95.0	4.8	86	24	72.0	2.0	27
OCT.	145	12	91.5	4.8	84	14	83.5	2.5	32
NOV.	26	17	34.5	0.5	24	19	20.0	0.3	13
DEC.	*148	9	94.0	5.7	*114	12	89.5	4.2	1
TOTAL	-	-	-	67.7	-	-	-	49.7	213
AVG.	148	9	94.0	5.6	114	12	89.5	4.1	18

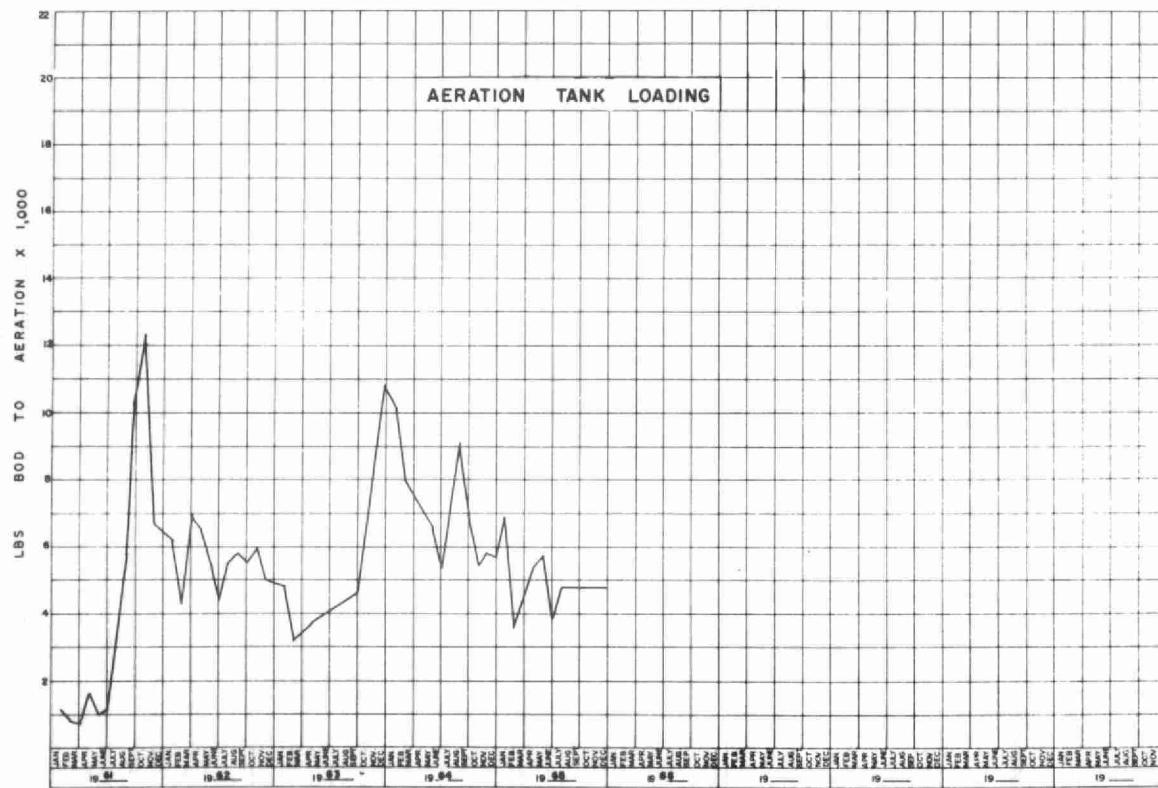
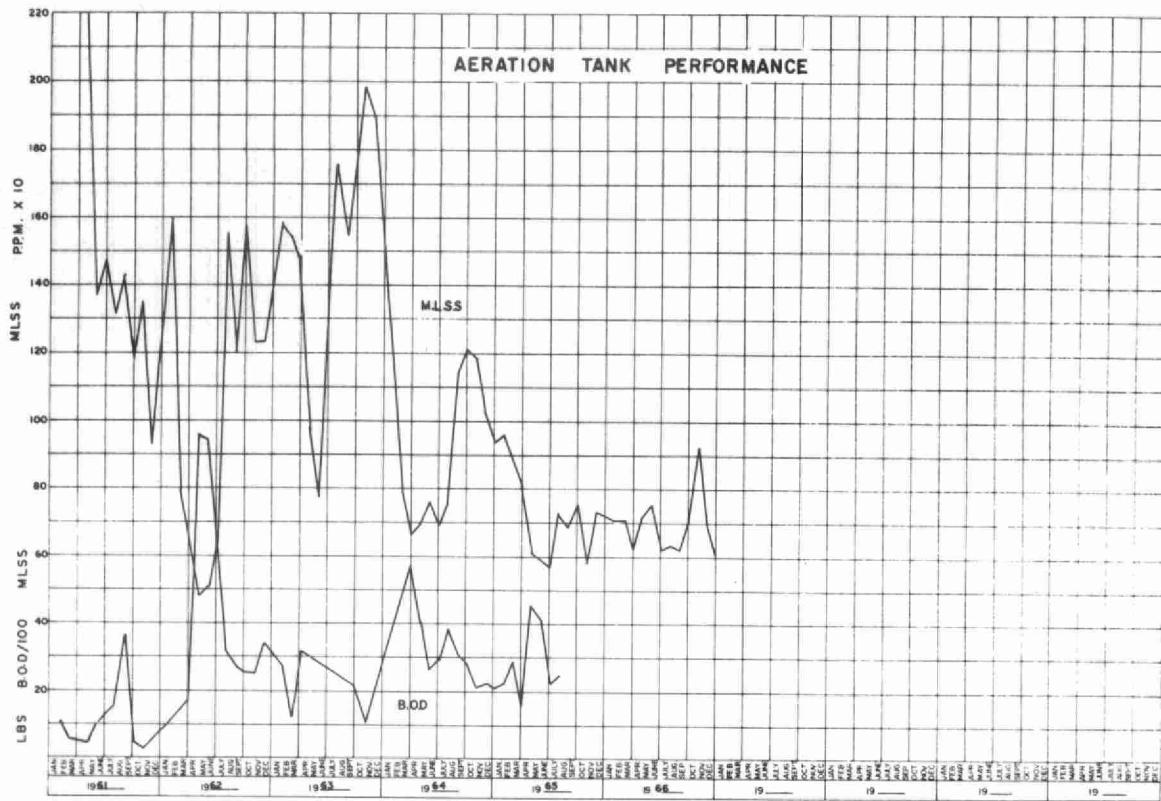
* Average value substituted. No sample.

COMMENTS

The average strength of the raw sewage in 1966 was 148 ppm BOD and 114 ppm SS. The strength of the BOD has remained the same in 1966 from that of 1965. However, the SS concentration in the raw sewage has decreased considerably from the 217 ppm SS in the raw sewage in 1965. These values are reasonable for domestic waste. The average concentration of BOD in the final effluent in 1966 was 9 ppm and the concentration of SS in the final effluent was 12 ppm. These values were obtained from eleven 8 hour composite samples collected from the treatment plant in 1966.

The total of 67.7 tons of BOD and 49.7 tons of SS was removed from the waste in 1966 which otherwise would have been discharged into the Muskoka River. This is an increase in the removal of BOD from 1965, but a decrease in the removal of SS.

A total of 213 cubic feet of grit was removed from the waste. This quantity is rather large for the Huntsville project. The large grit quantities are possibly due to the fact that the sewers on the west side of the river are largely combined.



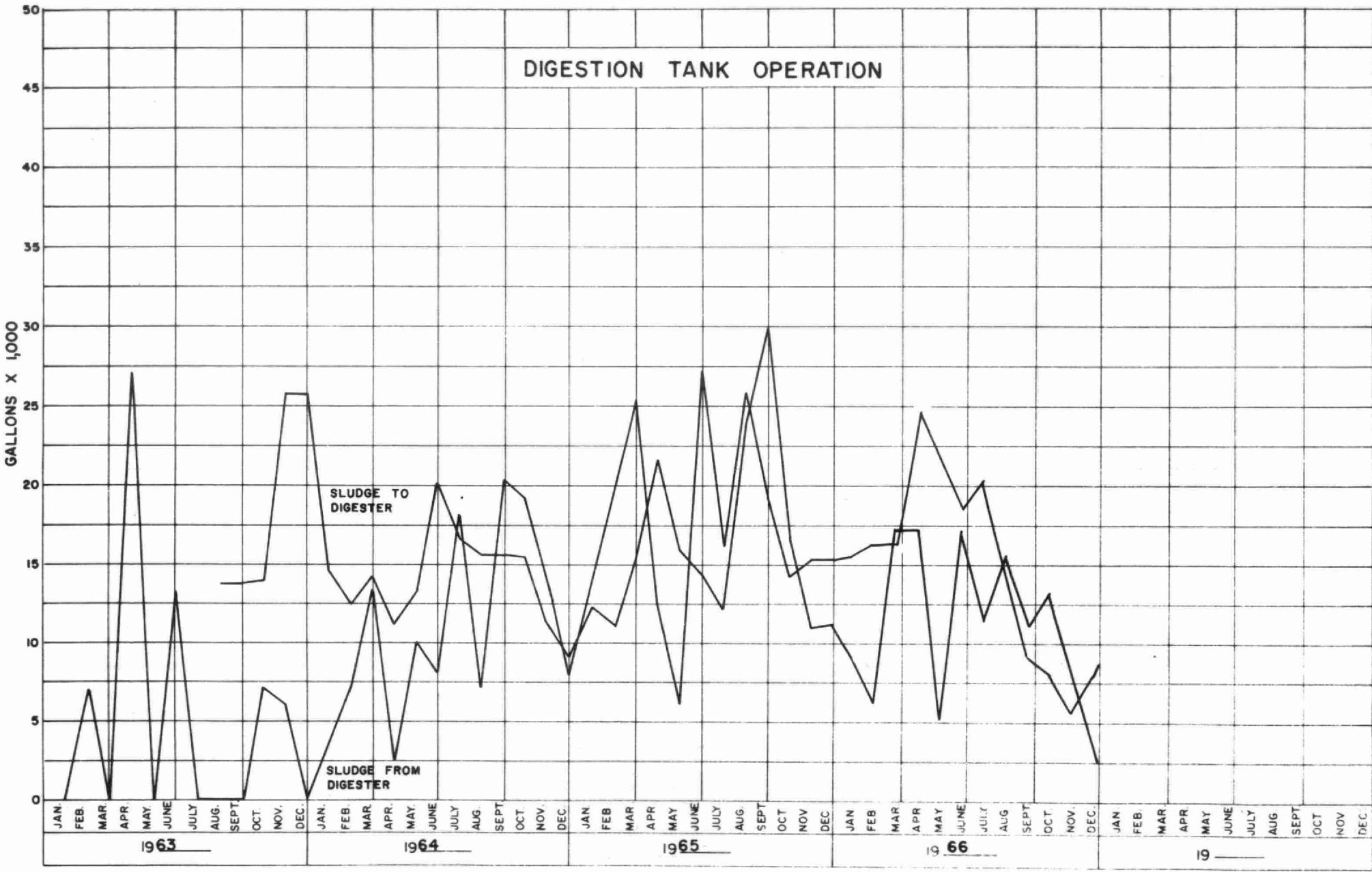
AERATION SECTION

	MLSS ppm		MLSS ppm
January	724	July	669
February	726	August	636
March	642	September	703
April	737	October	921
May	750	November	695
June	636	December	584
Average 702			

COMMENTS

The average concentration of mixed liquor in the aeration tanks at the Huntsville Water Pollution Control Plant in 1966 was 702 ppm. This is a reasonable figure for a mechanical aeration plant such as the one in the Town of Huntsville.

DIGESTION TANK OPERATION



DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS		
	1000'S CU FT.	% SOLIDS	% VOL. MAT.	1000'S CU. FT.	% SOLIDS	% VOL. MAT
JAN.	2.42	5.00	2.95	1.46	3.48	1.47
FEB.	2.58	3.94	2.90	0.97	3.06	1.56
MAR.	2.60	8.32	3.67	2.75	3.24	1.20
APR.	3.97	4.00	2.43	2.75	6.13	2.29
MAY	3.44	3.99	0.35	0.81	4.85	4.36
JUNE	2.96	4.11	1.54	2.75	6.40	2.30
JULY	3.25	5.23	-	1.94	4.49	-
AUG.	2.28	-	-	2.43	-	-
SEPT.	1.44	7.43	3.43	1.62	5.07	2.08
OCT.	1.28	6.61	-	2.10	7.62	-
NOV.	0.90	6.52	3.15	-	3.92	1.72
DEC.	1.24	-	-	0.49	-	-
TOTAL	28.36	-	-	20.07	-	-
AVG.	2.36	5.52	2.55	1.67	4.83	2.12

COMMENTS

A total volume of 28,360 cubic feet of raw sludge was pumped to the digester in 1966. In 1965 a total volume of 31,190 cubic feet of raw sludge was pumped to the digester. The quantity of sludge removed from the digester in 1966 was 20,000 cubic feet of digested sludge. This is a reduction by volume of approximately 36 percent.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	5.157	-	-
FEBRUARY	7.425	-	-
MARCH	10.891	-	-
APRIL	10.017	-	-
MAY	9.601	*163	2.10
JUNE	7.891	207	2.62
JULY	6.934	407	5.87
AUGUST	7.434	362	4.87
SEPTEMBER	6.334	263	4.15
OCTOBER	7.209	355	4.92
NOVEMBER	10.391	** 71	2.93
DECEMBER	8.183	-	-
TOTAL	97.467	1828	-
AVERAGE	8.122	261	3.98

* 25 days chlorination

** 7 days chlorination

COMMENTS

In 1966 the plant effluent was chlorinated for disinfection purposes from May 6 to November 7.

An average dosage of 3.98 ppm of chlorine was required to obtain a residual of 0.5 ppm chlorine after a contact period of fifteen minutes.

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RECOMMENDATIONS

The Town of Huntsville should continue its program of storm water separation from the sanitary sewers, thus alleviating the storm loading on the plant.

A satisfactory arrangement should be reached whereby additional manpower is available to protect the capital investment of the treatment plant and associated pumping stations. Work load has increased gradually for several years due to increased repair and maintenance on buildings and equipment.

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